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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-----------------------------|------------------|
| 10/609,097 | 06/27/2003 | William A. Stanton | 2269-5858US | 9228 |
| 24247 | 7590 | 02/05/2007 | | |
| TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110 | | | EXAMINER RUGGLES, JOHN S | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1756 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | | MAIL DATE | DELIVERY MODE | |
| 3 MONTHS | | 02/05/2007 | PAPER | |

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

10/609,097

Applicant(s)

STANTON ET AL.

Examiner

John Ruggles

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-15 and 17-22 is/are rejected.
- 7) ☒ Claim(s) 4,15,16 and 19-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 12/5/06 has now been entered.

Response to Amendment

Cancelled claims 23-26 have become the subject claims of divisional (DIV) application 11/336,229 filed on 1/20/06 (which claims priority to the instant parent application). Therefore, only claims 1-22, as currently amended on 12/5/06, remain under consideration in the instant application.

The previous objections to the specification and claims, as well as the previous rejections under the second paragraph of 35 USC 112 are withdrawn in view of the current amendment and accompanying remarks, except for those set forth below in this Office action.

The previous rejections under 35 U.S.C. 102(b) and 103(a), as well as the previous obviousness-type double patenting (ODP) rejections, are revised below as necessitated by Applicants' current claim amendments and accompanying remarks.

Claim Objections

The previous objections of claims 4 and 11-12 listed as (vi)-(viii) are withdrawn in view of current amendments to the applicable claims. However, other remaining claims objections are set forth below.

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Claims 15-16 and 19-22 are objected to because of the following informalities: (xi) in claim 15 line 7, "forming a sidelobe inhibitor at least one intersection" should be changed to --forming a sidelobe inhibitor across at least one intersection--; (xii) in claim 19 line 7, change "another of the diffraction rings" to --another of the diffraction ring[[s]]--; and (xiii) in claim 20 line 3, --inhibitor-- has been misspelled. Claim 16 depends from claim 15, and claims 20-22 depend from claim 19. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 12 line 1, the phrase "the predetermined threshold" lacks proper antecedent basis. For the purpose of this Office action, this phrase is interpreted to mean --the ~~predetermined threshold~~ identified proximity--, in accordance with the "identifying a proximity" previously recited in claim 11 line 2 (from which claim 12 depends).

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-10, 13-15, 17-19, and 21-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hasegawa et al. (US Patent 5,700,601).

Hasegawa et al. teach a phase shifting photomask (*instant claims 6 and 14*), mask (PSM), reticle (*instant claims 5 and 13*), or radiation-patterning tool that has a transparent main pattern area (passing non-PS radiation, e.g., light at 0°, etc.) in a semi-transparent film (also a phase shifter passing PS radiation, e.g., light at 180°, etc.) and a transparent auxiliary pattern of sidelobe inhibitor(s) (that passes radiation in the same phase (non-PS) as that of the transparent main pattern area, e.g., light at 0°, etc.) placed around or near the main pattern area to prevent generation of an unnecessary projected image (for mitigating, suppressing, or inhibiting sidelobes), a system for designing the mask, and a method for manufacturing the mask (title, abstract). Figures 3 and 9-10 (embodiments 2 and 4, respectively) show a radius (D, D') from the center or centroid of a main circular or square feature or opening (4, 8) to an undesirable diffraction ring, where one or more sub-resolution dimension transparent auxiliary patterns or sidelobe inhibitors (5, 9) that pass radiation in the same phase as the main pattern and are placed at optimum positions with respect to the main pattern that would be expected to suppress sidelobe printing (col. 20 line 41 to col. 21 line 56, col. 22 line 40 to col. 23 line 19, col. 27 lines

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46-55, and col. 29 line 66 to col. 30 line 8). The diffraction ring radius (D, D') = $b\lambda/NA_m$, where $1.35 < b \leq 1.9$, λ is the wavelength of exposure light or radiation, and NA_m is the mask-side numerical aperture of the projection lens (abstract). The auxiliary patterns or sidelobe inhibitors are either continuous (5 as shown in Figure 3) or separated into plural elements (9 as shown in Figures 9-10). Figures 16(b) and 17 in embodiment 8 show the effect of auxiliary sidelobe inhibitor square patterns with two closely spaced square main patterns (the radius of the corresponding diffraction ring (S) = $s\lambda/NA$, where $S = 650\text{nm}$, $\lambda = 365\text{nm}$, $NA = 0.52$, and $s = 0.926$, which means that the radius $S = 0.926 \lambda/0.52 \sim 0.9\lambda/NA$ or the radius (S) is about $0.8\lambda/NA$ to reduce the undesirable sidelobe intensity peaks at P2 and P3 as shown in curve "d" of Figure 17, while the width of the auxiliary sidelobe inhibitor square patterns $I = 200\text{nm} = i\lambda/NA$, leading to $i = 0.285$ so that the width $I = 0.285\lambda/0.52 = 0.548\lambda \sim 0.5\lambda$ (col. 26 line 56 to col. 27 line 55, reading on the *instant claims 2, 9, 17, and 21* for a diffraction ring radius of about $0.8\lambda/NA$ and also reading on *instant claims 3, 10, 18, and 22* for a sidelobe inhibitor side dimension or width of about $\lambda/2$). Embodiment 5 describes the use of a computer system and associated data file unit (understood to necessarily include a computer-readable medium having computer-executable instructions and/or similar other means for calculating intersections of diffraction rings around the center or centroid of each main pattern element) to design the layout of the size(s) and desired position(s) for the auxiliary sidelobe inhibitor patterns with respect to the main patterns on the mask (col. 23 line 20 to col. 24 line 67), which is believed to be inherently or obviously capable of performing the necessary calculations for defining main pattern elements and mathematical descriptions of associated diffraction rings, each diffraction ring having a predetermined radius ($S = \text{about } 0.8\lambda/NA$, as discussed above), and the

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intersections thereof for determining the placement locations of plural auxiliary sidelobe inhibitor patterns (each having a width or side dimension of about $\lambda/2$, as discussed above) with respect to the main pattern elements on the mask (reading on *instant claims 1, 7-8, 15, and 19*).

Claims 11-12 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (US Patent 5,700,601) in view of Kobayashi et al. (US Patent 5,700,606).

Hasegawa et al. do not specifically teach designing a mask pattern having a single sidelobe inhibitor at a single common location in lieu of separate sidelobe inhibitors at plural locations and a computer-readable medium having computer-executable instructions thereon for designing this mask pattern (as required by *instant claims 11-12 and 20*).

Kobayashi et al. teach a photomask, mask, reticle, or radiation-patterning tool having a patterned halftone film with an overlying light-shielding pattern at a position from which a sidelobe would be formed (the light-shielding pattern functions to prevent, inhibit, suppress, or mitigate a sidelobe) and a method of manufacturing it (title, abstract). Figures 7(a-c) and 8(a-c) show examples of overlapping/intersecting diffraction rings 12 (each around a main contact opening 11 that is adjacent to another main contact opening 11) for determining the placement of a sidelobe inhibitor on the mask at intersection 14 of adjacent diffraction rings to make circular images for contact holes with reduced, inhibited, or mitigated undesirable sidelobes 16 as shown in Figs 7(c) and 8(c) (col. 2 lines 48-59). The intensity of unwanted sidelobes becomes greater at closer pitches for main contact openings on the mask having a greater number of diffraction ring overlaps. The position of sidelobe generation from identified diffraction rings, each around a main contact opening in the mask pattern, can be calculated from the pattern size, pitch, and exposure conditions (col. 5 line 48 to col. 6 line 23, which encompasses the use of a

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mathematical construct around each intersection location between adjacent diffraction rings). A first mask having plural sidelobe inhibitors 3 is shown by Figures 2(a-b), in which the sidelobe inhibitors 3 have a width W1 for a first spacing between adjacent main contact openings on the mask, such that only two corresponding adjacent diffraction rings form intersections therebetween, as shown by position "II" in Figure 8(a). Figures 3(a-b) show an alternative second mask having a single common sidelobe inhibitor 3 with a width W2 that is centrally located between 4 main contact openings positioned at a second closer spacing than those on the first mask such that more than two corresponding adjacent diffraction rings form plural intersections therebetween, instead of or in lieu of placing overlapping sidelobe inhibitor(s) at each of plural diffraction ring intersections at or near a common location, as shown by position "I" in Figure 8(a) (col. 6 line 46 to col. 7 line 24). The method of manufacturing such masks is described at col. 7 line 25 to col. 9 line 24 in reference to Figures 1(a-g). With this method, it is easy to place the sidelobe inhibitor pattern at predetermined position(s) on the mask with high accuracy to prevent, inhibit, suppress, or mitigate sidelobe printing from the mask (col. 4 lines 1-4).

It would have been obvious to one of ordinary skill in the art at the time of the invention in the photomask, mask, reticle, or radiation-patterning tool that has a transparent main pattern area (passing non-PS radiation, e.g., light at 0°, etc.) in a semi-transparent film (also a phase shifter passing PS radiation, e.g., light at 180°, etc.) and a transparent auxiliary pattern of sidelobe inhibitor(s) (that passes radiation in the same phase (non-PS) as that of the transparent main pattern area, e.g., light at 0°, etc.) placed around or near the main pattern area to prevent generation of an unnecessary projected image (for mitigating, suppressing, or inhibiting

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sidelobes), a system for designing the mask, and a method for manufacturing the mask (taught by Hasegawa et al. and discussed above) to design the mask pattern having a single sidelobe inhibitor at a single common location in lieu of separate sidelobe inhibitors at plural locations, when needed to accommodate the greater intensity of unwanted sidelobes at closer pitches for main contact openings on the mask having a greater number of calculated and identified diffraction ring overlap intersections at or near a common location (taught by Kobayashi et al. as illustrated in Figure 8(a) for the position “I” mask patterns at a closer pitch having a greater number of diffraction ring overlaps in comparison to the position “II” mask patterns at a more distant pitch having a lesser number of diffraction ring overlaps). With this combined method of designing the mask and a computer-readable medium having computer-executable instructions thereon for designing this mask pattern, it is easy to calculate diffraction rings corresponding to the position and size of plural main contact openings on the mask, identify intersection location(s) for adjacent diffraction rings (e.g., with a mathematical construct around each intersection location for defining a common location in lieu of plural locations to avoid overlap of plural sidelobe inhibitors each having a width or side dimension of about $\lambda/2$ (as discussed above, *instant claims 11-12 and 20*), etc.), and place one or more sidelobe inhibitor pattern(s) at predetermined position(s) on the mask with high accuracy to prevent, inhibit, suppress, or mitigate sidelobe printing from the mask (as taught by Hasegawa et al. and Kobayashi et al.).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined

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application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 5-10, 13-15, 17-19, and 21-22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 6-12, 14-18, 20, 22, 24-25, 35-38, and 43-46 of US Patent 6,807,519 (Stanton '519) in view of Hasegawa et al. (US Patent 5,700,601, as discussed above). The conflicting claims of Stanton '519 are not identical to the instant claims, at least because the Stanton '519 patent claims recite relative spatial orientations of mask elements and vectors spanning between edges of design features within a threshold spatial distance to define placement of sidelobe inhibitors for laying out a mask pattern by a first computer design, whereas the instant claims involve descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out a mask pattern by a second computer design. The Stanton '519 patent claims also do not specifically recite other instantly claimed limitations that are taught by Hasegawa et al., as discussed above.

However, it would still have been obvious to one of ordinary skill in the art at the time of the invention in the photomask, mask, reticle, or radiation-patterning tool design and computer readable media embodying computer readable code for determining placement of sidelobe

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inhibitors for laying out a mask pattern by a first computer design (as recited by the patent claims of Stanton '519) to utilize an alternative second computer design known for some time that involves descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out the mask pattern (as taught by Hasegawa et al. and previously set forth above), both of which are computer derived mathematical constructs for determining the placement of sidelobe inhibitors on a mask.

Claims 11-12 and 20 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4, 6-12, 14-18, 20, 22, 24-25, 35-38, and 43-46 of US Patent 6,807,519 (Stanton '519) in view of Hasegawa et al. (US Patent 5,700,601, as discussed above), and further in view of Kobayashi et al. (US Patent 5,700,606, as discussed above). The conflicting claims of Stanton '519 are not identical to the instant claims, at least because the Stanton '519 patent claims recite relative spatial orientations of mask elements and vectors spanning between edges of design features within a threshold spatial distance to define placement of sidelobe inhibitors for laying out a mask pattern by a first computer design, whereas the instant claims involve descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out a mask pattern by a second computer design. The Stanton '519 patent claims also do not specifically recite other instantly claimed limitations that are taught by Hasegawa et al. and Kobayashi et al., both of which are discussed above.

However, it would still have been obvious to one of ordinary skill in the art at the time of the invention in the photomask, mask, reticle, or radiation-patterning tool design and computer readable media embodying computer readable code for determining placement of sidelobe

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inhibitors for laying out a mask pattern by a first computer design (as recited by the patent claims of Stanton '519) to utilize an alternative second computer design known for some time that involves descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out the mask pattern (as taught by Hasegawa et al. and previously set forth above), both of which are computer derived mathematical constructs for determining the placement of sidelobe inhibitors on a mask. It would also have been obvious in the combined second computer design of sidelobe inhibitors for laying out a mask pattern (as recited by the patent claims of Stanton '519 and taught by Hasegawa et al., previously set forth above) to design the mask pattern having a single sidelobe inhibitor at a single common location in lieu of separate sidelobe inhibitors at plural locations, when needed to accommodate the greater intensity of unwanted sidelobes at closer pitches for main contact openings on the mask having a greater number of calculated and identified diffraction ring overlap intersections at or near a common location (as taught by Kobayashi et al. and discussed above). With this combined method of designing the mask and a computer-readable medium having computer-executable instructions thereon for designing this mask pattern, it is easy to calculate diffraction rings corresponding to the position and size of plural main contact openings on the mask, identify intersection location(s) for adjacent diffraction rings (e.g., with a mathematical construct around each intersection location for defining a common location in lieu of plural locations when such plural locations would otherwise result in overlap of plural sidelobe inhibitors each having a width or side dimension of about $\lambda/2$ (as discussed above, *instant claims 11-12 and 20*), etc.), and place one or more sidelobe inhibitor pattern(s) at predetermined position(s) on the mask with high accuracy to prevent, inhibit, suppress, or mitigate sidelobe printing from the mask (as

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recited by the patent claims of Stanton '519 in combination with the teachings of Hasegawa et al. and Kobayashi et al.).

Claims 1-3, 5-10, 13-15, 17-19, and 21-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 51-61 of copending Application No. 10/953,982 (corresponding to US Publication 2005/0049839, Stanton '982) in view of Hasegawa et al. (US Patent 5,700,601, as discussed above). The conflicting claims of Stanton '982 are not identical to the instant claims, at least because the Stanton '982 application claims recite a method of forming a reticle, photopatterning tool, or mask that includes defining pattern features on the mask and determining which pattern features are within a threshold distance between these pattern features that can lead to sidelobe overlap, calculating vectors describing the distance and direction between edges of the pattern features that are within the threshold spatial distance, utilizing the vectors to identify regions of the mask where sidelobe overlap can occur (for laying out a mask pattern by a first computer design), and forming sidelobe inhibitors across at least some of the identified regions of the mask, whereas the instant claims involve descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out a mask pattern by a second computer design. The Stanton '982 application claims also do not specifically recite other instantly claimed limitations that are taught by Hasegawa et al., as discussed above.

However, it would still have been obvious to one of ordinary skill in the art at the time of the invention in the method of forming a reticle, photopatterning tool, or mask that includes determining placement of sidelobe inhibitors for laying out a mask pattern by a first computer design (as recited by the application claims of Stanton '982) to utilize an alternative second

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computer design known for some time that involves descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out the mask pattern (as taught by Hasegawa et al. and previously set forth above), both of which are computer derived mathematical constructs for determining the placement of sidelobe inhibitors on a mask.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 11-12 and 20 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 51-61 of copending Application No. 10/953,982 (corresponding to US Publication 2005/0049839, Stanton '982) in view of Hasegawa et al. (US Patent 5,700,601, as discussed above), and further in view of Kobayashi et al. (US Patent 5,700,606, as discussed above). The conflicting claims of Stanton '982 are not identical to the instant claims, at least because the Stanton '982 application claims recite a method of forming a reticle, photopatterning tool, or mask that includes defining pattern features on the mask and determining which pattern features are within a threshold distance between these pattern features that can lead to sidelobe overlap, calculating vectors describing the distance and direction between edges of the pattern features that are within the threshold spatial distance, utilizing the vectors to identify regions of the mask where sidelobe overlap can occur (for laying out a mask pattern by a first computer design), and forming sidelobe inhibitors across at least some of the identified regions of the mask, whereas the instant claims involve descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out a mask pattern by a second computer design. The Stanton '982 application claims also do not specifically recite

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other instantly claimed limitations that are taught by Hasegawa et al. and Kobayashi et al., both of which are discussed above.

However, it would still have been obvious to one of ordinary skill in the art at the time of the invention in the method of forming a reticle, photopatterning tool, or mask that includes determining placement of sidelobe inhibitors for laying out a mask pattern by a first computer design (as recited by the application claims of Stanton '982) to utilize an alternative second computer design known for some time that involves descriptions of diffraction ring intersections to define placement locations of sidelobe inhibitors for laying out the mask pattern (as taught by Hasegawa et al. and previously set forth above), both of which are computer derived mathematical constructs for determining the placement of sidelobe inhibitors on a mask. It would also have been obvious in the combined method of designing and forming a reticle, photopatterning tool, mask, photomask, or radiation-patterning tool that includes determining placement of sidelobe inhibitors for laying out a mask pattern by a second computer design of sidelobe inhibitors for laying out a mask pattern (as recited by the application claims of Stanton '982 and taught by Hasegawa et al., previously set forth above) to design the mask pattern having a single sidelobe inhibitor at a single common location in lieu of separate sidelobe inhibitors at plural locations, when needed to accommodate the greater intensity of unwanted sidelobes at closer pitches for main contact openings on the mask having a greater number of calculated and identified diffraction ring overlap intersections at or near a common location (as taught by Kobayashi et al. and discussed above). With this combined method of designing and forming the mask and a computer-readable medium having computer-executable instructions thereon for designing this mask pattern, it is easy to calculate diffraction rings corresponding to

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the position and size of plural main contact openings on the mask, identify intersection location(s) for adjacent diffraction rings (e.g., with a mathematical construct around each intersection location for defining a common location in lieu of plural locations when such plural locations are closer or more proximate than a predetermined threshold to avoid overlap of plural sidelobe inhibitors each having a width or side dimension of about $\lambda/2$ (as discussed above, *instant claims 11-12 and 20*), etc.), and place one or more sidelobe inhibitor pattern(s) at predetermined position(s) on the mask with high accuracy to prevent, inhibit, suppress, or mitigate sidelobe printing from the mask (as recited by the application claims of Stanton '982 in combination with the teachings of Hasegawa et al. and Kobayashi et al.).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Allowable Subject Matter

Claims 4 and 16 are objected to as being dependent upon rejected base claims (claim 4 depends from rejected independent claim 1 and claim 16 depends from rejected independent claim 15), but claims 4 and 16 would be allowable if rewritten (a) to include all of the limitations of the applicable base claim(s) and any intervening claim(s) and (b) so that all applicable claim objection(s) set forth in this Office action are also overcome.

Applicants' current arguments on page 18 with respect to "guard rings" and "intersections of guard rings" have been fully considered and are persuasive with regard to claims 4 and 16. Accordingly, claims 4 and 16 would be allowable if they are rewritten in the manner described above.

Response to Arguments

Most of Applicants' arguments on pages 14-23 of 24 in the current amendment remain unpersuasive for at least the same reasons as previously indicated (e.g., in regard to Applicants' current arguments on pages 16-20 about the instant requirement that each of the sidelobe inhibitors are located to pass radiation in phase with the radiation passing through the main pattern elements on the mask, see the previous 9/7/06 Office action page 22 response to these arguments, etc.).

In response to Applicants' argument on page 18 that the references fail to show certain features of Applicants' invention as recited in claims 1-3, 5-10, 13-15, 17-19, and 21-22, it is noted that the features upon which Applicants rely (i.e., "guard rings" and "intersections of guard rings") are not recited in these rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to Applicants' argument on page 20 that the use of radiation blocking inhibitors in the mask design process taught by Kobayashi et al. is different from the instant mask design process using sidelobe inhibitors that pass radiation in phase with the radiation passing through the main pattern elements on the mask, the test for obviousness is not whether the features of a secondary reference (Kobayashi et al.) may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, Kobayashi et al. is not relied upon to teach

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a mask design process using sidelobe inhibitors that pass radiation in phase with the radiation passing through the main pattern elements on the mask, at least because this limitation is taught by the primary reference (Hasegawa et al.) for the same reasons as previously discussed and again referred to above.

In response to Applicants' argument on page 20 that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the reasons for combining Kobayashi et al. with Hasegawa et al. were previously discussed and are repeated above in the rejections of this Office action.

In response to Applicants' argument on page 20 that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Applicants' disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). In particular, Kobayashi et al. teach that it is easy to design a mask pattern having a single sidelobe inhibitor at a single common location in lieu of separate sidelobe inhibitors at plural locations in order to accommodate the greater number of diffraction ring overlaps when main pattern elements on the mask are closer

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together (e.g., also see the above discussion of these teachings in combination with those of Hasegawa et al., etc.).

Applicants' other arguments with respect to claims 1-3, 5-15, and 17-22 have been considered, but they are either unpersuasive in regard to those rejections maintained above, at least in part, or they are moot in view of the revised ground(s) of rejection set forth above (in response to Applicants' current amendment and accompanying remarks).

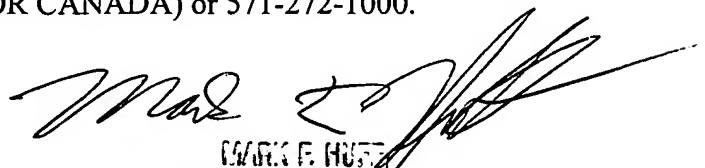
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 571-272-1390. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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